

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number
WO 2004/114017 A1

(51) International Patent Classification⁷: **G03F 7/00**,
B29C 45/73, B82B 3/00

(21) International Application Number:
PCT/IB2004/002120

(22) International Filing Date: 22 June 2004 (22.06.2004)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
TO2003A000473 23 June 2003 (23.06.2003) IT

(71) Applicant (for all designated States except US): **INFM IS-
TITUTO NAZIONALE PER LA FISICA DELLA MA-
TERIA** [IT/IT]; Corso F. Perrone, 24, I-16152 Genova
(IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **TORMEN, Massimo**
[IT/IT]; Via Giovanni Pascoli 10, I-34138 Trieste (IT).

(74) Agents: **GERBINO, Angelo**, et al.; Jacobacci & Partners
SpA, Corso Regio Parco 27, I-10152 Torino (IT).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

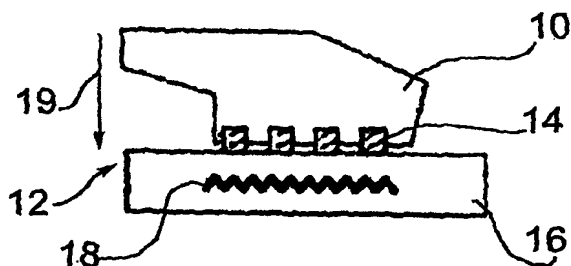
- as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii)) for the following designations AE,
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,
EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,
MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM,
ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA,
SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,
BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,
IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
SN, TD, TG)
- of inventorship (Rule 4.17(iv)) for US only

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: A NANO IMPRESSION LITHOGRAPHIC PROCESS WHICH INVOLVES THE USE OF A DIE HAVING A REGION
ABLE TO GENERATE HEAT



(57) Abstract: A lithographic process for forming a pattern in
relief (20) on a mass (10) of polymeric material comprises the
steps of: preparing the mass (10) of polymeric material and a die
(12) having a surface region (14) facing towards the mass (10) of
polymeric material and which reproduces in negative the pattern
in relief (20); heating the die (12) and putting the mass (10) of
polymeric material into contact with the die (12) in any temporal
sequence, in such a way that the part of the mass (10) of poly-
meric material in contact with the surface zone (14) is subject to
softening; and separating the die (12) from the mass (10) of poly-
meric material on the surface of which the pattern in relief (20)
has been formed. The heating of at least one part of the die (12)

is obtained by generation of thermal energy upon dissipation of another form of energy in at least one region (16) of the die (12).